acetate, the azeotrope has 28.7 wt. % water. However, as seen in Table A, the stoichiometric amount of water produced in the n-butyl acetate reaction mixture (13.4%) is well below the amount necessary to match the azeotrope. In this situation, water must be added to the distillation column to maintain the azeotrope. This is the addition of water to which Papa refers.

Although Papa mentions the production of a variety of esters, the teachings of the reference are applicable to reactions in which there is a shortage of water produced in the reaction zone, such as the exemplified butyl acetate production. In contrast, the present invention is directed to production of ethyl acetate wherein more water is produced than the azeotrope will remove.

The rejected claims recite that vapors from the reaction zone are directed to a distillation means to form an azeotrope containing 10 wt. % water or less. Since the **vapors from the reaction zone** are directed to the distillation means, this is a "first distillation". The azeotrope is condensed to from an organic phase and an aqueous phase. A portion of the organic phase is directed to the reaction zone. As disclosed at line 15 of page 6, the organic phase from the first distillation is "rich in ethyl acetate." A portion of this organic phase is directed to the reaction zone 8 via line 30. Directing a portion of the ethyl acetate rich organic phase to the reaction zone decreases the load on the trays, while still providing the necessary azeotroping agent to the reaction zone. *See*, page 6 at lines 25-27. It is significant that the first distillation rich in ethyl acetate is used because, as pointed out in Table A, the stoichiometric amount of water produced in the reaction zone is 17.0% while the corresponding azeotrope contains 8.7% water. Thus, adding ethyl acetate helps satisfy the water/ethyl acetate azeotrope. Accordingly, as disclosed in lines 1-2 of page 3, the present invention applies to situations in which more water is produced in the esterification reaction than the corresponding azeotrope will remove.

Papa simply fails to disclose or suggest such an arrangement. Papa only discloses directing an organic phase to the reaction zone for the purpose of delivering recovered unreacted carboxylic acid to the reaction zone. *See*, lines 48-65 of column 9. Papa provides no teaching or suggestion, that a portion of the ester rich organic phase from the first distillation is to be directed to the reaction zone, regardless of the ester being produced. Papa teaches that the entire organic phase from the first distillation is directed to a second distillation to recover carboxylic acid that is directed to the reaction zone. Indeed, since, as disclosed at lines 27-31 of column 9, the organic phase from

Papa's first distillation contains ester product, Papa teaches away form directing a portion of this stream to the reaction zone. Papa expressly teaches that the entire first distillation stream should be distilled again to recover ester product before directing a portion of the remaining stream, containing carboxylic acid, to the reaction zone. To direct an ester rich stream to the reaction zone is directly at odds with Papa's teachings. For this reason alone, Papa either alone or in combination with Spiske fails to render the pending claims obvious under 35 U.S.C. 103.

Moreover, since Papa relates to esterification reactions that produce less water than required for the corresponding azeotrope, there would be no azeotroping benefit to adding an ester rich stream to the reaction zone. In fact, addition of the ester would have the effect or moving the mixture away from the appropriate azeotrope concentration. As pointed out by Papa, water should be added to maintain the azeotrope, not ester.

## CONCLUSION

Consistent with the foregoing, Applicants' claims 6-11 are in condition for allowance. Reconsideration of these claims with an early Notice of Allowance is respectfully solicited.

Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number listed below so that all matters may be expeditiously resolved.

Respectfully Submitted,

M. Susan Spiering

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M. Susan Spiering
Reg. No. 34,933
Attorney for Applicant

**Celanese Ltd.**
**NEW ADDRESS since Oct. 2002**
IP Legal Dept., IZIP 701
P.O. Box 428
Hwy 77 South
Bishop, TX 78343

Tel: 361.584.6804
Department Fax No: 361.584.6230
e-mail: MSSpiering@celanese.com